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## CLINICAL ASPECTS AND TREATMENT OF HELMINTHIASIS

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There are over 150 types of parasitic worms and helminths which may attack the intestinal tract in humans. The most common parasite is the helminth causing enterobiasis. The symptomatology and epidemiology of enterobiasis is closely related to the development cycle of the helminth -- the oxyuris. Usually the adult form can be isolated from the intestine at any point from about the middle of the small intestine to the end of the colon. The matured larvae, which are ready to lay their eggs and are found in the lower part of the colon, make their way through the intestinal tract and eventually lay their eggs in the perianal regions; therefore, tests on the excrements generally are positive. The life span of the oxyuris is from 3 weeks to a month, but the prolonged nature of enterobiasis is the result of its rapid multiplication. Symptoms of enterobiasis are limited to itching in the anal region just prior to sleep. In children, in addition to the itching, there may also be symptoms characteristic of enterocolitis. In some adults there is a certain degree of nervous symptom which accompanies enterobiasis. Generally this is manifested in the form of insomnia which in itself is caused by the itching.

The treatment consists primarily in preventing further invasion by oxyuris. In some of the mild cases treatment may be successful without resorting to medicinal preparations, and colonic irrigation with warm, soapy water is recommended. The patient must use clean underwear nightly and wash his hands with soap and brush prior to meals and subsequent to his toilet.

A systematic course of treatment is necessary in the more serious forms of this disease. One of the most widely used therapies involves administration of sulfur depuratum. The initial dose is one gram given three times daily at meal time for 5 days (the dose for children is 0.05 gram for each year of age). It is usually necessary to carry out three to five courses at intervals of 4 days. Colonic irrigation is recommended prior to retiring for the night.

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Phenothiazine, which is a much more effective agent, also requires great care in its administration. It is given two to three times daily post cibum in doses of 0.5 to 1.0 gram for adults, and 0.3 to 0.5 gram for children from 2 to 16 years old. The series is usually continued for 4 to 5 days and may be repeated, but only at intervals of one month. Phenothiazine is not to be used in anemia, hepatitis, or kidney diseases.

Ascariasis is due to infestation with ascarides in the body. They range in length from 15 to 40 centimeters. The infection spreads from maturing eggs. The larvae penetrate the intestinal walls, enter the blood stream, and are carried along in the blood circulatory system. They feed on blood plasma. When these helminths reach the lungs they find their way into the alveoli and cause capillary hemorrhage. The ascarides then proceed along the respiratory tract, enter the throat and are swallowed. After a time these worms become inured to peristalsis. The development cycle from egg to egg-laying state is about 60 to 90 days. The pathogenesis and symptoms become evident during the early stages of ascariasis and are usually manifested when the ascarides become active in the small intestine. The patient's body is affected by the metabolic by-products of the larvae. This substance is released directly into the blood stream, and for a time the course of the disease indicates an allergic characteristic during its early stages. When there is a large number of ascarides, there is considerable hemorrhage and much microflora can be found in the lungs. Mild ascariasis is characterized by brief pneumonitis and eosinophilia. Frequently these inflammatory conditions are discovered in the course of examinations for influenza or bronchopneumonia. During the early stages of ascariasis, dermatosis resembling nettle rash is also evident. At times this symptom is very clearly defined and is the only indication of ascariasis. The second stage in the course of the disease involves intestinal disorders, leading to loss of appetite, gastritis, and vertigo. Some case histories show that these parasites enter the body through surgical incisions, through typhoid fever ulcers, and may prolong the course of dysentery, scarlet fever and tuberculosis. Analysis of the feces will not give positive results in all cases. X-ray diagnosis is recommended using barium meal. This substance permits determination of the parasites, which appear as light worm-like images.

Generally, santonin, or its derivative sancaffeine, is used in the treatment of ascariasis. Santonin is administered in doses of 0.1 gram for adults and 0.05 gram for each year in the age of children t.i.d. It is administered between meals, with the first dose sometime prior to a light breakfast. A laxative is administered at the end of the day. Sancaffeine is administered daily for 2 days. The doses vary from one tablet for children 2 to 3 years old to four tablets for children from 10 to 12 years old. Sancaffeine is administered in two doses with a half-hour interval. Patients undergoing either the santonin or sancaffeine treatment are warned not to take rich or highly seasoned foods. Use of the above-mentioned medicines is not recommended for those with nephritis or fever.

Hexylresorcinol, which has been proved the most effective drug for treating ascariasis, is administered in doses of 1.2 to 1.5 grams. Administration of a laxative is suggested for the evening following the administration of hexylresorcinol. It is important that the patient take no food for 5 hours after administration of the drug. Moreover, it irritates the mucous membrane of the alimentary tract and consequently is not recommended for patients with gastric and intestinal ulcers. A light diet is recommended during treatment and for a short period subsequent to treatment.

Tapeworm is also a human parasite causing such diseases as "teniarinchosis," taeniasis, hymenolepiasis, and diphyllorhynchiasis. Symptoms of "teniarinchosis," taeniasis and diphyllorhynchiasis can be determined by mild manifestation of gastrointestinal symptoms and disturbances of the nervous system and blood circulatory system. Sometimes the course of the disease is severe and "teniarinchosis" takes

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on the syndrome of appendicitis. Diphyllbothriasis has the syndrome of pernicious anemia. In all cases it is necessary to determine the patient's general condition before undertaking specific therapy (liver preparations). Taeniasis may be caused not only by the invasion of semimature parasites but also by the larvae (this might result in cysticercosis of the brain, eyes, and muscles).

The best method for eliminating the parasites which are responsible for the last-named diseases is an ether extract of the male fern. It is necessary to prepare the patient before starting treatment. Doses are 5 - 6 grams for children 1 - 5 years old, to 3 - 4 grams for children 6 - 12 years old /sic/. The male fern extract can be administered perorally in the form of an emulsion of bicarbonate of soda in capsules. Its use is not recommended in pregnancy, nausea, nephropathy, and disturbances of the central nervous system.

Hymenolepiasis affects children more often than adults. It has a course somewhat similar to enteritis. Extract of male fern is recommended. Initial doses are small, ranging from 3.0 grams to 1.2 grams. Doses are administered once, and may be repeated in 10 to 12 days if necessary. It is important that the patient be on a rich diet with fish oils or protein-enriched foods.

In all cases, immunity plays an important role. It is therefore necessary that the patient have a well-balanced diet with a good amount of vitamins.

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